

55. (Amended) A mesostructured material comprising:
a first region having a polymeric surface comprising a polymeric compound;
and
a second region provided on the polymeric surface of the first region, the
second region having mesopores,
wherein the mesopores are oriented in a first direction parallel to the surface
and the polymeric compound of the polymeric surface is oriented in a second direction.

Kindly add new claims 58 and 59 as follows:

58. (New) The mesostructured material according to any one of claims
1, 13, 48, 50 and 55, wherein the first region and the second region are made from different
materials.

59. (New) The mesostructured material according to any one of claims
1, 13, 48, 50 and 55, wherein the first region is a polymer film.

REMARKS

The claims at issue are 1-23, 48-52 and 55-59, with claims 1, 13, 48, 50 and
55 being independent. Claims 24-47, 53 and 54 have been withdrawn from consideration
by the Examiner as being directed to non-elected inventions. Claims 1, 13, 48, 50 and 55
have been amended to better define the present invention. Support for these amendments

may be found throughout the specification and the drawings. Claims 3 and 14-23 have been amended to reflect the changes to claims 1 and 13.

New claims 58 and 59 have been added. Support of these claims may be found throughout the specification and the claims. No new matter has been introduced by the amendments to claims 1, 3, 13, 48, 50 and 55 and the addition of claims 58 and 59. Reconsideration of the present claims is expressly requested.

Claims 1-9, 11-19, 20, 23, 48-52 and 55-57 stand rejected under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Patent No. 6,027,666 (Ozin). Claims 10 and 21 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ozin in view of U.S. Patent No. 6,171,687 (Leung). Claim 22 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ozin in view of U.S. Patent No. 4,919,810 (Itoh). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly discuss some of the key features and advantages of the presently claimed invention with reference to Fig. 1B. The present invention is directed to a mesostructured material. This material has a first region (12) with a polymeric surface, which has been subjected to an alignment control treatment. Due to this treatment, the polymer chains or molecules of the polymeric surface are oriented in a particular direction. Therefore, when mesopores (13) are formed in the second region (14) located on the polymeric surface, these mesopores are formed on a multitude of planes parallel to the surface¹ and are oriented in a single direction, i.e., if all mesopores were projected onto a single plane that is parallel to the polymeric surface, these mesopores would be substantially parallel to each other on that plane.

¹/For example, Fig. 1B shows three planes parallel to the polymeric surface on which the mesopores are formed.

Ozin is directed to materials comprising stabilized luminescent silicon clusters. This reference is substantially different from the presently claimed invention.

Ozin discloses a mesostructured silica film grown on the air-water interface² and subsequently transferred to or grown on the water-polyethylene interface. However, Ozin does not disclose or suggest that the molecules or polymeric chains of the polyethylene bottle are oriented in a particular direction or that the surface of the bottle is or should be subjected to an alignment control treatment. As can be clearly seen in Comparative Example 1 at pages 25 and 26 of the subject specification, when the polymeric surface is not subjected to an alignment control treatment such as a rubbing treatment, the mesopores that are formed are not oriented in a single direction.

Thus, while the mesopores of Ozin may be substantially parallel to the surface, they are not oriented in a single direction, i.e., they would not be parallel to each if projected onto a single plane that is parallel to the surface. In fact, the mesopores in Ozin are understood to be randomly oriented, since Ozin discloses a mesostructured material that is similar to the one formed in Comparative Example 1 in the subject application.

Therefore, it is clear that Ozin does not disclose, teach or suggest a mesostructured material having mesopores, which are oriented in a single direction and are arranged on a free polymeric surface made of a polymer compound whose chains or molecules are oriented in a specific direction because the polymeric surface has been subjected to an alignment control treatment. Accordingly, Ozin cannot anticipate the present invention or render it unpatentable.

The deficiencies of Ozin cannot be cured by Leung or Itoh. These references have been discussed in Applicants' response filed on March 29, 2002. This

²/This would result in what Ozin calls a "free standing form" at col. 6, line 12 and Example 2.

discussion is incorporated herein in its entirety. As stated in the March 29, 2002 Amendment, even if assumed, arguendo, that Leung and Itoh contain the teachings alleged by the Examiner, these references do not teach or suggest the same features of the presently claimed invention that are missing in Ozin, i.e., a mesostructured material having mesopores, which are oriented in a single direction and are arranged on a free polymeric surface made of a polymer compound whose chains or molecules are oriented in a specific direction because the polymeric surface has been subjected to an alignment control treatment. Thus, the presently claimed invention is patentable over Ozin, Leung and Itoh, whether these patents are considered separately or in any combination.

This Amendment After Final Rejection should be entered because it places the case in allowable form without raising new issues requiring further consideration and/or search. Alternatively, it places the case in better form for possible appeal.

Applicants respectfully request that all rejections be withdrawn and the present case passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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APPENDIX

Application No. 09/478,884
Attorney Docket No. 03500.014215

IN THE CLAIMS:

Claims 1, 3, 13-23, 48, 50 and 55 have been amended as follows:

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1. (Twice Amended) A mesostructured material comprising:
a first region having a polymeric surface; and
a second region provided on the polymeric surface of the first region, the
second region having tubular mesopores,
[the mesostructured material being arranged on a polymeric surface
constituted of a polymeric compound,] wherein the tubular mesopores are oriented towards
a first direction parallel to the surface and the polymeric surface has been subjected to an
alignment control treatment.

3. (Twice Amended) The mesostructured material according to claim 1
or 2, wherein polymer chains of a [the] polymeric compound of [on] the polymeric surface
are oriented in a second direction.

13. (Twice Amended) A mesostructured material [silica] comprising:
a first region having [arranged on] a polymer material surface[,] in which
chains of the polymer material are oriented in a first direction parallel to the polymer

material surface; and

a second region provided on the polymer material surface of the first region,

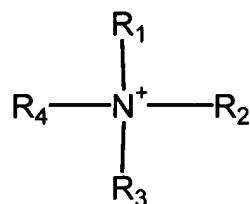
the second region [,] having tubular mesopores,

wherein the tubular mesopores are oriented in a second direction nearly perpendicular to the first direction, and the oriented tubular mesopores are formed on the polymer material surface by locating silica outside of an oriented surfactant micelle structure of which orientation is determined by parallel accommodation of molecules of the surfactant on the chains of the polymer material through chemical interaction.

14. (Amended) The mesostructured material [silica] according to claim 13, wherein the surfactant is a cationic surfactant or nonionic surfactant.

15. (Amended) The mesostructured material [silica] according to claim 14, wherein the cationic surfactant is a quaternary alkylammonium salt.

16. (Amended) The mesostructured material [silica] according to claim 15, wherein the quaternary alkylammonium is represented by the following structural formula:



wherein R_1 to R_3 are independently a methyl group or ethyl group and R_4 is a C_{10} to C_{18}

straight chained alkyl group.

17. (Amended) The mesostructured material [silica] according to claim 16, wherein the R₄ is a C₁₂ to C₁₆ straight chained alkyl group.

18. (Amended) The mesostructured material [silica] according to claim 14, wherein the nonionic surfactant is an alkylamine or a surfactant containing polyethylene oxide as a hydrophilic group.

19. (Amended) The mesostructured material [silica] according to claim 13, wherein the polymer material surface is comprised of a Langmuir-Blodgett film.

20. (Amended) The mesostructured material [silica] according to claim 13, wherein the polymer material is at least one polymer selected from the group consisting of polyethylene, nylon, polybutylene terephthalate, polyethylene terephthalate, polyester, polyimide and parylene polyparaxylilene.

21. (Amended) The mesostructured material [silica] according to claim 20, wherein the polymer material is polyimide.

22. (Amended) The mesostructured material [silica] according to claim 13, wherein the mesopores are hollow.

23. (Amended) The mesostructured material [materials] according to claim 13, wherein the polymer material surface is constituted of a film of the polymer material, the film being arranged on a substrate, and the substrate is made of silicon oxide.

48. (Twice Amended) A mesostructured material comprising:
a first region having a polymeric surface; and
a second region provided on the polymeric surface of the first region, the
second region having tubular mesopores,
[the mesostructured material being arranged on a polymeric surface,]
wherein the tubular mesopores are oriented in a direction parallel to the surface, and the direction is determined by a direction of a rubbing treatment of the polymeric surface.

50. (Amended) A mesostructured material comprising:
a first region having a polymeric surface comprising a polymeric compound;
and
a second region provided on the polymeric surface of the first region, the
second region having tubular mesopores,
[the mesostructured material being arranged on a polymeric surface
constituted of a polymeric compound,] wherein the tubular mesopores are oriented in a direction parallel to the surface, and the direction is determined by an orientation direction of the polymeric compound's polymer chain.

55. (Amended) A mesostructured material comprising:

a first region having a polymeric surface comprising a polymeric compound;

and

a second region provided on the polymeric surface of the first region, the
second region having mesopores,

[the mesostructured material being arranged on a polymeric surface
constituted of a polymeric compound,] wherein the mesopores are oriented in a first
direction parallel to the surface and the polymeric compound of the polymeric surface is
oriented in a second direction.

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